COMMENTS AND RESPONSE

In view of the comments below, Applicant respectfully requestss that the Examiner reconsider the present application including rejected claims, as amended, and withdraw the claim rejections.

Abstract

The Examiner has objected to the abstract, and has suggested that Applicant delete line 17. By this response Applicant has made the recommended deletion. Therefore he requests that the Examiner withdraw the objection to the abstract.

Drawings

The Examiner has objected to the drawings under 35 U.S.C. § 1.83(a) for allegedly failing to show a number of elements. In response to this objection, Applicant has cancelled claims 19-21 and 47-56 without prejudice or disclaimer, has amended Figure 8A, and has added new Figures 8D and 16A to 16C.

The Examiner has asserted that an isolation device configured to couple a splitter to a combiner is not shown in the drawings. Applicant has amended Figure 8A to show this feature, e.g., by the second isolation device 394. Support for this amendment to Figure 8A comes, for example, from originally filed claims 13 and 41.

The Examiner has asserted that the isolation device including an amplifier is not shown in the drawings. Applicant has added Figure 8D to show this feature, e.g., by the inverting amplifier 396. Support for this new Figure 8D comes, for example, from originally filed claims 14 and 42.

The Examiner has asserted that an inverting isolation device is not shown in the drawings. Applicant has added new Figure 8D to show this feature, e.g., by the inverting amplifier 396. Support for this new Figure 8D comes, for example, from originally filed claims 15 and 43.

The Examiner has asserted that an isolation device configured to couple a splitter to a delay element is not shown in the drawings. Applicant has amended Figure 8A to show this feature, e.g., by the first isolation device 392. Support for this amendment to Figure 8A comes, for example, from originally filed claims 16 and 44.

The Examiner has asserted that an isolation device configured to couple an output terminal to a splitter is not shown in the drawings. By this response Applicant has cancelled claims 19-21 and 47-56. As a result, no pending claims recite this feature.

The Examiner has asserted that a magnetic circulator device is not shown in the drawings. By this response Applicant has cancelled claims 21 and 49-56. As a result, no pending claims recite this feature.

The Examiner has asserted that a delay element including a transmission line is not shown in the drawings. Applicant has added new Figure 16A to show this feature, e.g., by the transmission line 1610. Support for this new Figure 16A comes, for example, from originally filed claim 22.

The Examiner has asserted that a delay element including a series of series L and shunt C is not shown in the drawings. Applicant has added new Figure 16B to show this feature, e.g., by the series inductor sections 1620 and the shunt capacitor sections 1630. Support for this new Figure 16B comes, for example, from originally filed claim 23.

In addition, Applicant has added Figure 16C to show that the amplifiers 300, 310, 320 in Figure 8A could be formed by a series of series resistor sections and shunt capacitor sections. Support for this new Figure 16C comes from originally filed claim 24.

Thus, since the above drawing changes are being made to bring the drawings into conformance with the originally-filed disclosure, no new matter is being added by any of these changes.

Based on the above drawing amendments, new drawings, and claim cancellations, all claimed material is fully described in the drawings. Applicant therefore respectfully requests that the Examiner withdraw the objection to the drawings under 35 U.S.C. § 1.83(a).

Specification

The Examiner has objected to the specification based on a number of informalities.

In this response the Applicant has inserted corrected serial numbers wherever they are required. Applicant has also made the corrections recommended by the Examiner throughout the specification.

Applicant therefore respectfully requests that the Examiner withdraw the objection to the specification.

In addition, Applicant has added two new paragraphs between the last paragraph pf page 34 and the first paragraph of page 35. These two new paragraphs describe the operation of the circuit of amended Figure 8A and the specific operation of the amplifiers and the isolation devices. Support for these new paragraphs can be found, for example, in originally-filed claims 11-18, 22-26, and 39-44.

Applicant has also added a new paragraph on page 13 describing Figure 8D, and a new paragraph on page 14 describing Figures 16A to 16C. Support for these new paragraphs can be found, for example, in originally-filed claims 15, 22-24, and 43.

Claim Objections

The Examiner has objected to 6, 7, 60-63, and 67-70 because of a few informalities.

In particular, claims 6 and 7 were objected to because they did not have a space between the word "Claim" and the number "4." By this response, Applicant has made this correction.

Claims 60-63 and 67-70 were objected for allegedly having a missing space between the claim number and the claim language. With respect to claims 60 and 63, Applicant observes that there is a space properly located between the claim number and the claim language. With respect to claims 61, 62, and 67-70, Applicant has added a space as requested by the Examiner.

The amendments made to claims 6, 7, 61, 62, and 67-70 each only place a single space in the claim to correct a clerical error. As a result, they do not serve to further limit any of these claims.

Based on these amendments and arguments, Applicant respectfully requests that the Examiner withdraw the objection to claims 6, 7, 60-63, and 67-70.

Claim Rejections - 35 USC § 102

The Examiner has rejected claims 1-3, 29, 30, 31, and 59-62 under 35 U.S.C. § 102(b) as being allegedly anticipated by United States Patent No. 5,325,204 to Scarpa ("Scarpa"). Applicant respectfully traverses this rejection.

Applicant's claim 1 recites an "RFI extraction mechanism for passing a UWB signal while suppressing a narrowband interference signal that overlaps said UWB signal in frequency." Claim 1 further recites "an incoming signal that includes a UWB signal and the narrowband interference signal." This shows that the recited circuit operates on incoming signal energy that includes both a UWB signal and a narrowband signal.

In contrast, Scarpa discloses a digital notch filter apparatus for removing narrowband interference signals from a *wideband* communications signal. (See, e.g., Scarpa, abstract, lines 1-3.) Therefore, Scarpa does not disclose receiving an incoming signal that includes a UWB signal, as required by claim 1.

In addition, Applicant has amended claim 1 to recite "a first component that has a first impulsive shape," and "at least one other component delayed in time from said first component, and having a second impulsive shape," and that "first and second widths of the first and second impulsive shapes, respectively, are less than a reference width of a half cycle of a highest frequency of the UWB signal." Support for this amendment comes, for example, on page 9, lines 13-15, of Applicant's specification. Nothing in Scarpa discloses or suggests this feature.

Claims 2 and 3 depend upon claim 1 and are allowable for at least the reasons given above for claim 1.

Applicant's claim 29 recites an "an antenna input configured to receive a UWB signal that overlaps in frequency with a narrowband interference signal." Claim 29 further recites "a tracking correlator configured to detect said UWB signal," and "a network having an input terminal configured to receive an incoming signal that includes a UWB signal and the narrowband interference signal." This shows that the recited circuit operates on incoming signal energy that includes both a UWB signal and a narrowband signal.

In contrast, Scarpa discloses a digital notch filter apparatus for removing narrowband interference signals from a *wideband* communications signal. (See, e.g., Scarpa, abstract, lines 1-3.) Therefore, Scarpa does not disclose receiving an incoming signal that includes a UWB signal, as required by claim 29.

In addition, Applicant has amended claim 29 to recite "a circuit configured to have an impulse response having a first component that has a first impulsive shape, and at least one other component delayed in time from said first component, and having a second impulsive shape," wherein "first and second widths of the first and second impulsive shapes, respectively, are less than a reference width of a half cycle of a highest frequency of the UWB signal." Support for this amendment comes, for example, on page 9, lines 13-15, of Applicant's specification. Nothing in Scarpa discloses or suggests this feature.

Claims 30 and 31 depend upon claim 29 and are allowable for at least the reasons given above for claim 29.

Applicant's claim 59 recites an "RFI extraction mechanism for passing a UWB signal while suppressing a narrowband interference signal that coincides with said UWB signal in frequency."

In contrast, Scarpa discloses a digital notch filter apparatus for removing narrowband interference signals from a *wideband* communications signal. (See, e.g., Scarpa, abstract, lines 1-3.) Therefore, Scarpa does not disclose receiving an incoming signal that includes a UWB signal, as required by claim 59.

In addition, Applicant has amended claim 59 to recite that "first and second widths of the first and second impulse response components, respectively, are less than a reference width of a half cycle of a highest frequency of the UWB signal." Support for this amendment comes, for

example, on page 9, lines 13-15, of Applicant's specification. Nothing in Scarpa discloses or suggests this feature.

Claims 60-62 all ultimately depend upon claim 59 and are allowable for at least the reasons given above for claim 59.

Based on at least the arguments given above, Applicant therefore respectfully requests that the Examiner withdraw the rejection of claims 1-3, 29, 30, 31, and 59-62 under 35 U.S.C. § 102(b) as being allegedly anticipated by Scarpa.

The Examiner has rejected claims 58, 66, and 71 under 35 U.S.C. § 102(b) as being allegedly anticipated by United States Patent No. 4,577,168 to Hartmann ("Hartmann"). Applicant respectfully traverses this rejection.

Applicant's claim 58 recites a "means for adjusting a relative position of said first impulse response component and second impulse response component so as to pass a UWB signal, but substantially cancel a narrowband interfering signal." This shows that the recited circuit operates on incoming signal energy that includes both a UWB signal and a narrowband signal.

The Examiner acknowledges that Hartmann does not disclose a UWB receiver, but rather shows a *wideband* receiver. Since Hartmann does not disclose this feature recited in claim 58, it cannot properly be used under § 102(b) as a basis for a rejection of claim 58.

Applicant's claim 58 also recites "means for inverting and time-shifting a first impulse response component and a second impulse response component in the radio front end, each of said first impulse response component having a first impulsive shape and the second impulse response component having a second impulsive shape," and, as noted above, "means for adjusting a relative position of said first impulse response component and second impulse

response component so as to pass said UWB signal, but substantially cancel a narrowband interfering signal." Neither of these features is disclosed in Hartmann.

Hartmann discloses in its Fig. 29 a transformer bridge circuit having a SAW impedance element 48 and a conventional impedance 50. The circuit is designed such that equal impedances are achieved at a desired notch frequency. Under that condition a balance occurs between the two paths and no signal is transmitted to the output load resistor. The transformer bridge circuit includes a phase reversal transformer 56, which causes the signal through one leg to be out of phase with the signal in the other leg at resonance. In this way the circuit passes a signal in all bands but the pass band defined by the notch.

However, nothing in Hartmann discloses or suggests passing separate components of the incoming signal. Each leg of the circuit of Fig. 29 passes the whole signal. It's just that the SAW impedance acts as a band pass filter and only passes the signal during a preset frequency band.

Furthermore, nothing in Hartmann discloses a circuit that adjusting the relative position of any component of the incoming signal. Once the SAW impedance is set in the devices shown in Hartmann, it will be fixed. A SAW impedance can't be changed dynamically. Thus, Hartmann shows no means for adjusting a relative position of said first impulse response component and second impulse response component so as to pass said UWB signal, but substantially cancel a narrowband interfering signal.

In addition, Hartmann does not disclose that the first impulse response component has a first impulsive shape and the second impulse response component has a second impulsive shape, as recited in claim 58. And since a SAW impedance will not function properly with an impulse signal (as recited in claim 58) Hartmann cannot even suggest such an alteration. The SAW circuits shown in Hartmann will not be functional as designed with an impulse signal.

Applicant's claim 66 recites an "adjustable RFI extraction mechanism for passing a UWB signal while suppressing a narrowband interference signal that overlaps said UWB signal in frequency." This shows that the recited circuit operates on incoming signal energy that includes both a UWB signal and a narrowband signal.

The Examiner acknowledges that Hartmann does not disclose a UWB receiver, but rather shows a *wideband* receiver. Since Hartmann does not disclose this feature recited in claim 66, it cannot properly be used under § 102(b) as a basis for a rejection of claim 66.

Claim 66 also recites "a second transmission line having a second impedance and configured to convey a portion of said incoming signal for a predetermined distance and reflect said portion of said incoming signal," and "a receiving transmission line having a third impedance configured to receive respective portions of said incoming signal from said first transmission line and a reflected portion of said incoming signal from said second transmission line so as to create an impulse response having a first component that has a shape of a wavelet portion of said UWB signal and a second component that is delayed in time and inverted in at least one of shape and phase relative to multiple cycles of the narrowband interference signal.

As noted above, Hartmann discloses in its Fig. 29 a transformer bridge circuit having a SAW impedance element 48 and a conventional impedance 50. The circuit is designed such that equal impedances are achieved at a desired notch frequency. Under that condition a balance occurs between the two paths and no signal is transmitted to the output load resistor. The transformer bridge circuit includes a phase reversal transformer 56, which causes the signal through one leg to be out of phase with the signal in the other leg at resonance. In this way the circuit passes a signal in all bands but the pass band defined by the notch.

Nothing in Hartmann discloses a second transmission line having a second impedance and configured to convey a portion of said incoming signal for a predetermined distance and reflect said portion of said incoming signal, as recited in claim 66. Both the conventional impedance and the SAW impedance pass a signal, but do not reflect it.

Similarly, nothing in Hartmann discloses or suggests passing separate portions of the incoming signal. Each leg of the circuit of Fig. 29 passes the whole signal. It's just that the SAW impedance acts as a band pass filter and only passes the signal during a preset frequency band. Thus, Hartmann does not discloses or suggest a second transmission line "configured to convey a portion of said incoming signal," as recited in claim 66.

Applicant's claim 71 recites a "means for adaptively adjusting a relative position of said first impulse response component and said second impulse response component to pass said UWB signal, but cancel a narrowband interfering signal." This shows that the recited circuit operates on incoming signal energy that includes both a UWB signal and a narrowband signal.

The Examiner acknowledges that Hartmann does not disclose a UWB receiver, but rather shows a *wideband* receiver. Since Hartmann does not disclose this feature recited in claim 71, it cannot properly be used under § 102(b) as a basis for a rejection of claim 71.

Claim 71 also recites "means for time-shifting a first impulse response component and a second impulse response component of a UWB radio front end, said first impulse response component having a shape of a first wavelet of a UWB signal and said second impulse response component having a shape of a second wavelet of a UWB signal to be received," and "means for adaptively adjusting a relative position of said first impulse response component and said second impulse response component to pass said UWB signal, but cancel a narrowband interfering signal." Hartmann does not disclose or suggest either of these features.

Hartmann does not disclose treating different impulsive components (i.e., first and second impulsive components) of an incoming signal differently. As noted above, each leg of the circuit of Fig. 29 passes the whole signal. It's just that the SAW impedance acts as a band pass filter and only passes the signal during a preset frequency band. Thus, Hartmann does not discloses or suggest a "means for adaptively adjusting a relative position of said first impulse response component and said second impulse response component," as recited in claim 71. Since it does not treat separate impulse response components differently, it cannot disclose this feature.

Hartmann also does not disclose that the first impulse response component has a shape of a first wavelet of a UWB signal and the second impulse response component has a shape of a second wavelet of a UWB signal, as recited in claim 71. And since a SAW impedance will not function properly with an impulsive wavelet (as required by claim 71) Hartmann cannot even suggest such an alteration. The SAW circuits shown in Hartmann will not be functional as designed with an impulse wavelet signal.

Based on at least the arguments given above, Applicant therefore respectfully requests that the Examiner withdraw the rejection of claims 58, 66, and 71 under 35 U.S.C. § 102(b) as being allegedly anticipated by Hartmann.

Claim Rejections - 35 USC § 103

The Examiner has rejected claims 4 and 72-76 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Scarpa in view of United States Patent No. 6,215,359 to Peckham et al. ("Peckham"). Applicant respectfully traverses this rejection. However, given the Examiner's comments, it appears as of this rejection should properly have been a rejection under 35 U.S.C. § 103(a) based on Scarpa in view of Peckham and Hartmann.

Claim 4 and 72-74 depend variously from claim 1 and are allowable for at least the reasons given above for claim 1. Claims 75 and 76 depend from claim 31 and are allowable for at least the same reasons given above for claim 31. Nothing in Peckham cures the deficiencies in Scarpa discussed above.

Furthermore, the Examiner has provided no motivation to combine the teachings of Peckham with those of Scarpa. All that is provided in the rejection after a recitation of what Scarpa and Peckham show is the blanket assertion that "it would have been obvious to one of ordinary skill in the art to modify Scarpa to incorporate [the claim language] in order to efficiently amplify and transmit signals at more than one frequency band while suppressing first, second, and higher order harmonics."

It is not sufficient to maintain a rejection, however, for the Examiner to simply identify each claimed element in cited references. Rejecting claims based solely on the Examiner finding corollaries for the claimed elements would permit the Examiner to use the claimed invention itself as a blueprint for piecing together elements in the prior art to defeat the patentability of the claimed invention. And such an approach is not permissible.

In order to prevent the use of hindsight based on the invention, the Examiner must show a motivation to combine the cited elements – some reason that a skilled artisan confronted with the same problems as the inventor and with no knowledge of the claimed invention would select the elements from the cited prior art references for combination in the manner claimed. But it is not sufficient for the Examiner to issue a simple invocation of skill in the art. If such a rote invocation were sufficient to supply a motivation to combine, most areas of technology would rarely experience a patentable technical advance. The requirement of a suggestion to combine

stands as a critical safeguard against hindsight analysis and rote application of the legal test for obviousness.

Because the Examiner did not provide anything beyond a general assertion of motivation to combine, based on the Examiner's skill in the art, Applicant asserts that the Examiner engaged in hindsight analysis, improperly using Applicant's own claimed invention to provide the motivation to combine the cited references.

Based on at least the arguments given above, Applicant therefore respectfully requests that the Examiner withdraw the rejection of claims 4 and 72-76 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Scarpa in view of Peckham.

The Examiner has rejected claims 5-12, 14, 15, 22-28, 32-40, and 77 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Scarpa in view of Peckham, and further in view of Hartmann, and further in view of United States Patent No. 6,501,942 to Weismann et al. ("Weismann"). Applicant respectfully traverses this rejection.

Claim 5-12, 14, 15, and 22-28 depend variously from claim 1 and are allowable for at least the reasons given above for claim 1. Claims 32-40 and 77 all ultimately depend from claim 29 and are allowable for at least the same reasons given above for claim 29. Nothing in Weismann, Hartmann, or Peckham cure the deficiencies in Scarpa discussed above.

In addition, claim 5 further recites that "said characteristic impedance of said second transmission line is substantially equal to a parallel combination of said characteristic impedance of said first transmission line and said characteristic impedance of said receiving transmission line." One embodiment of claim 5 is shown, for example, in Applicant's Figures 4d and 4e, which show that the transmission line stub 130 (25 Ω) has an impedance equal to the value of the

transmission line 150 (50 Ω) and the transmission line 170 (50 Ω) in parallel. This in not shown by any of Scarpa, Peckham, Weismenn, or Hartmann, alone or in combination.

The Examiner has asserted that this feature is shown by Figs. 29 and 30a of Hartmann. However these portions of Hartmann do not show this feature. Hartmann specifically notes that the SAW impedance element 48 and the conventional impedance 50 in the two legs 52 and 54 are chosen such that equal impedances are achieved at the desired notch frequency. But it does not disclose anything else regarding relative impedance values, and notes that "the optimum source impedance 106 and load impedance 108 to use with this particular circuit are each equal to RB/2 where RB is resistor 92." Nothing else is said in Hartman about the impedances of the elements. Thus, nothing in Hartmann discloses or suggests that the characteristic impedance of a second transmission line is substantially equal to a parallel combination of a characteristic impedance of a first transmission line and a characteristic impedance of a receiving transmission line, as recited in claim 5.

Furthermore, the Examiner has provided no motivation to combine the teachings of Peckham, Weismann, and Hartmann with those of Scarpa. All that is provided in the rejection after a recitation of what Scarpa, Peckham, Weismann, and Hartmann show is the blanket assertions that "it would have been obvious to one of ordinary skill in the art to modify Scarpa in combination with Peckham et al. to incorporate [the claim language] so that equal impedances area achieved at the desired notch frequency and a balance occurs and so signal is transmitted tot eh output load resistor," and "it would have been obvious to one of ordinary skill in the art to modify the inventions of Scarpa in combination with Peckham et al. in further view of Hartmann to incorporate [the claim language] so that the level of the amplified signal is maintained at a

level consistent with the link budget." Nothing is said regarding any motivation to add the teachings of Weismann.

As argued above, because the Examiner did not provide anything beyond a general assertion of motivation to combine, based on the Examiner's skill in the art, Applicant asserts that the Examiner engaged in hindsight analysis, improperly using Applicant's own claimed invention to provide the motivation to combine the cited references. And with respect to Weismann, the Examiner has provided no motivation at all to combine this document with the others. This lack of motivation to combine is particularly relevant given the large number of documents cited by the Examiner.

Based on at least the arguments given above, Applicant therefore respectfully requests that the Examiner withdraw the rejection of claims 5-12, 14, 15, 22-28, 32-40, and 77 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Scarpa in view of Peckham, and further in view of Hartmann, and further in view of Weismann.

The Examiner has rejected claim 57 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hartmann in view of United States Patent No. 6,185,418 to MacLellan et al. ("MacLellan"). Applicant respectfully traverses this rejection.

Claim 57 recites a first transmission line having a predetermined impedance and configured to convey an incoming signal that includes a UWB signal and a narrowband signal, a stub having a second impedance and configured to convey a portion of said incoming signal for a predetermined distance and reflect said portion of said incoming signal, and a receiving transmission line having a third impedance configured to receive respective portions of said incoming signal from said first transmission line and a reflected portion of said incoming signal

from said stub." This is not disclosed or suggested by Hartmann or MacLellan, alone or in combination.

The Examiner has asserted that these features are shown by Figs. 29 and 30a of Hartmann. However, this is not a correct description of what Hartmann teaches. Fig. 29 of Hartmann shows a transformer-bridge notch filter in which a SAW impedance element is used. Fig. 30a illustrates a variation of an all-pass filter that can be used for notch filter applications by replacing its capacitors with SAW impedance elements. But the circuits shown in these two drawings are not specifically related to each other.

The fact that Fig. 29 of Hartmann discloses a conventional impedance 50 along with a leg 54 attached to that impedance, and Fig. 30a of Hartmann discloses a capacitor 58 that can be replaced with a SAW impedance element does not disclose or suggest the first transmission line, stub, and receiving transmission line recited in claim 57. In particular, the recited first transmission line must be configured to convey an incoming signal that includes a UWB signal and a narrowband signal; the recited stub must be configured to convey a portion of that same incoming signal for a predetermined distance and reflect that portion of the incoming signal; and the recited receiving transmission line must be configured to receive respective portions of the incoming signal from the first transmission line and the reflected portion of the incoming signal from the stub. There is nothing in Hartmann or MacLellan that suggests that the elements cited by the Examiner be placed in this kind of a relationship.

In fact, the elements shown in Fig. 30a cannot even be properly called a stub at all. A capacitor connected to ground between two series inductors is not a stub, and cannot be used to suggest a stub.

Furthermore, claim 57 further requires that the circuit create an impulse response having a first component that has a shape of a wavelet portion of the UWB signal and a second component that is delayed in time and inverted in shape from the UWB wavelet. Nothing in Hartmann or MacLellan discloses or suggests combining two components, one of which is a delayed and inverted copy of the other. The Examiner has asserted that this is shown in Figs. 32, 36, and 39 of Hartmann. However, these drawings do not show the first and second components recited in claim 57.

Fig. 32 of Hartmann is a graph showing input admittance both real an imaginary for a SAW impedance element in a very limited range in the vicinity of the operating frequency. Fig. 36 of Hartmann illustrates the bandwidth of a notch of Fig. 33 for the case of circuit parameters shown as case D in Table 1. And Fig. 39 of Hartmann shows the performance of the notch of Fig. 38 using a SAW impedance element. Although some of these drawings do show the operation of a notch filter, none show an impulse response having a first impulse component and a second impulse component that is delayed in time and inverted in shape.

Nothing in MacLellan cures the deficiencies in Hartmann noted above.

Furthermore, the Examiner has provided no motivation to combine the teachings of MacLellan with those of Hartmann. All that is provided in the rejection after a recitation of what Hartmann and MacLellan show is the blanket assertions that "it would have been obvious to one of ordinary skill in the art to modify Hartmann to incorporate a system with [the claim language] to more efficiently use the available bandwidth of a time-varying RF channel and/or to provide a flexible and adaptive digital communications system."

As argued above, because the Examiner did not provide anything beyond a general assertion of motivation to combine, based on the Examiner's skill in the art, Applicant asserts

that the Examiner engaged in hindsight analysis, improperly using Applicant's own claimed invention to provide the motivation to combine the cited references.

Based on at least the arguments given above, Applicant therefore respectfully requests that the Examiner withdraw the rejection of claim 57 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hartmann in view of MacLellan.

The Examiner has rejected claim 63 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Scarpa in view of MacLellan. Applicant respectfully traverses this rejection. Claim 63 "a control receiver configured to detect a signal energy level and a signal to noise ratio of said UWB signal," and "a sensor configured to detect an output power of said UWB signal." Neither of Scarpa or MacLellan, alone or in combination, disclose or suggest this feature.

The Examiner has asserted that these features are shown in Scarpa. In particular, the Examiner has asserted that the detection of signal energy level and signal-to-noise ratio are shown in column 7, lines 59-68, and in column 8, lines 1-21. This passage states that "as illustrated in FIG. 4, in one embodiment of the present invention, the acquisition filter 30 is implemented with a -3dB bandwidth 8 times as wide as the tracking filter 32. This exemplary ratio may be altered to permit the cancellation of interference signals with even lower signal-to-noise ratios." However, simply stating that the ratio of the -3dB bandwidths of the acquisition filter 30 and the tracking filter 32 can be altered for different SNR values does not disclose or suggest a control receiver configured to detect a signal energy level and a signal to noise ratio or a sensor configured to detect an output power.

The passage cited by the Examiner also states that one of either the acquisition center frequency control circuit 35 or the tracking center frequency control circuit 37, is used at any given time to control the center frequency of both the acquisition filter 30 and the tracking filter

32. However, controlling a center frequency does not disclose or suggest anything regarding detecting a signal energy level, a signal-to-noise ratio, or an output power level, as recited in claim 63.

Furthermore, the Examiner has provided no motivation to combine the teachings of MacLellan with those of Scarpa. All that is provided in the rejection after a recitation of what Scarpa and MacLellan show is the blanket assertions that "it would have been obvious to one of ordinary skill in the art to modify Hartmann to incorporate [the claim language] so as to produce an output data stream to more efficiently use the available bandwidth of a time-varying RF channel and/or to provide a flexible and adaptive digital communications system."

As argued above, because the Examiner did not provide anything beyond a general assertion of motivation to combine, based on the Examiner's skill in the art, Applicant asserts that the Examiner engaged in hindsight analysis, improperly using Applicant's own claimed invention to provide the motivation to combine the cited references.

Based on at least the arguments given above, Applicant therefore respectfully requests that the Examiner withdraw the rejection of claim 63 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Scarpa in view of MacLellan.

The Examiner has rejected claims 64 and 65 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Scarpa in view of Hartmann. Applicant respectfully traverses this rejection.

Claim 64 recites a method for controlling a relative position of a first impulse response component and a second impulse response component of a radio-front end in a UWB receiver. This method includes "receiving at [a] radio-front end a UWB signal corrupted with narrowband interference at a predetermined frequency." Nothing in Scarpa or Hartmann, alone or in combination, discloses or suggests this feature.

As noted above, neither Scarpa nor Hartmann disclose or suggest receiving a UWB signal with a narrowband signal. Scarpa discloses receiving a wideband signal, and Hartmann discloses filtering UHF signals. But neither discloses or suggests that their teachings be used in UWB implementations, as recited in claim 64.

Claim 64 also recites "determining a relative position of the first impulse response component and the second impulse response component to cancel said narrowband interference." Nothing in Scarpa or Hartmann, alone or in combination, discloses or suggests this feature.

In particular, nothing in Scarpa or Hartmann discloses or suggests controlling the relative positions of two separate components in a UWB receiver. The Examiner asserts that Hartmann shows the step of determining a relative position of the first impulse response component and the second impulse response component in column 13, lines 22-48. However, nothing in this portion of Hartmann discloses or suggests this feature.

The cited passage in Hartmann simply discloses a notch filter that uses two parallel impedance elements. The notch filter uses a first circuit having a single-port, single-phase, unidirectional transducer in parallel with an inductance which has a value of inductance that will resonate with the static capacitance represented by the transducer at frequencies in the notch bandwidth. In this device, all frequencies are nominally passed by that parallel circuit except those in the notch bandwidth frequency range where resonance occurs and the circuit becomes primarily resistive. However, also coupled in parallel with the first circuit is a second circuit having a phase reversal transformer in series with a resistance which equals the resistive characteristic of the circuit at resonance, which ensures that equal signals of opposite phase are combined at the output of the two circuits thus canceling all frequencies in the range of the notch and rejecting or preventing transmission of a predetermined bandwidth of frequencies. Thus,

while Hartmann does disclose a notch filter that has parameters chosen to ensure that equal signals of opposite phase are combined at an output, it does not disclose anything about dynamically determining relative positions of components of an impulse response.

In addition, given the use of SAW elements, the parameters for the circuit in Hartmann will be fixed and cannot be adjusted during operation. Thus, Hartmann would have no reason to determine a relative position, which relative position could then be used to later determine an amplifier bias of an amplifier to achieve that relative position. The functioning of the SAW impedance of Hartmann must be fixed at manufacture, and cannot be dynamically controlled.

Claim 64 also recites "determining an amplifier bias of an amplifier in said radio front end to achieve said relative position; accessing a memory table containing a target value for said amplifier bias corresponding to the predetermined frequency; and sending the target value to the amplifier." Nothing in Scarpa or Hartmann, alone or in combination, discloses or suggests this combination of features.

The Examiner has cited Scarpa, column 7, lines 31-45, as showing the recited feature of determining an amplifier bias to achieve the relative position. However, all this portion of Scarpa discloses is that the gain parameters A1, A2, B1, and B2 in Figs. 3A and 3B can be varied in different embodiments. And although these gain values influence how the center frequency control circuit 37 of the narrow tracking filter 32 advances the filters' center frequencies, altering these gain parameters does not have anything to do with relative positions of first and second impulse response components of an incoming signal. Furthermore, determining these parameters for use in various embodiments is not the same as dynamically determining an amplifier bias for use in operation.

The Examiner has cited Scarpa, column 11, lines 27-51, as showing the recited features of accessing a memory table containing a target value for said amplifier bias corresponding to the predetermined frequency, and sending the target value to the amplifier. And while it is true that Scarpa uses coarse and narrow SIN/COS lookup tables 126 and 128 coupled to the inputs of adjustable weight elements 42, 50, 52, 54, 72, 80, 82, and 84, this does not show the features of accessing a memory table and sending the target value to the amplifier, as recited in claim 64.

In claim 64, the memory table contains target values for the amplifier bias corresponding to the predetermined frequency. But this is the same amplifier bias determined in the previous step. But nothing is shown in Scarpa to suggest that the values accessed from the coarse and narrow SIN/COS lookup tables 126 and 128 are determined in a radio front end to achieve a relative position.

Claim 65 is dependent upon claim 64 and is allowable for at least the reasons given above for claim 64.

In addition, claim 65 recites "tracking changes in the predetermined frequency," and "adjusting said target value sent to said amplifier." This is not disclosed or suggested in Scarpa or Hartmann, alone or in combination.

As noted above, the Examiner has cited Scarpa, column 7, lines 31-45, as showing the recited feature of tracking changes. However, all this portion of Scarpa discloses is that the gain parameters A1, A2, B1, and B2 in Figs. 3A and 3B can be varied in different embodiments. Nothing in this passage discloses or suggests tracking changes in a frequency. Although these gain values influences how the center frequency control circuit 37 of the narrow tracking filter 32 advances the filters' center frequencies, altering these gain parameters for various embodiments is not the same as tracking changes in a frequency, as recited in claim 65.

The Examiner has cited Scarpa, column 11, lines 27-51, as showing the recited step of adjusting the target value sent to the amplifier. Although this portion of Scarpa discloses is that the output of the switch 130 is coupled to a gain control input of each of the adjustable weight elements 42, 50, 52, 54, 72, 80, 82, 84, of the acquisition filter 30 and the tracking filter 32, this is not the same as adjusting said target value sent to said amplifier, as recited in claim 65.

The amplifier recited in claim 65 is the same amplifier in claim 64 for which the step of determining an amplifier bias of an amplifier in said radio front end to achieve said relative position is performed. However, the elements using the gain values A1, A2, B1, and B2 are not the adjustable weight elements 42, 50, 52, 54, 72, 80, 82, 84 that receive their inputs from the coarse and narrow SIN/COS lookup tables 126 and 128.

Furthermore, the Examiner has provided no motivation to combine the teachings of Scarpa with those of Hartmann. All that is provided in the rejection after a recitation of what Hartmann and Scarpa show is the blanket assertions that "it would have been obvious to one of ordinary skill in the art to modify Scarpa to incorporate [the claim language] to ensure that equal signals of opposite phase are combined at the output of range of the notch and rejecting or preventing transmission of a predetermined bandwidth of frequencies."

As argued above, because the Examiner did not provide anything beyond a general assertion of motivation to combine, based on the Examiner's skill in the art, Applicant asserts that the Examiner engaged in hindsight analysis, improperly using Applicant's own claimed invention to provide the motivation to combine the cited references.

Based on at least the arguments given above, Applicant therefore respectfully requests that the Examiner withdraw the rejection of claims 64 and 65 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Scarpa in view of Hartmann.

The Examiner has rejected claims 67-69 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hartmann in view of Peckham. Applicant respectfully traverses this rejection.

Claims 67-69 all ultimately depend from claim 66 and are allowable for at least the reasons given above for claim 66. Nothing in Peckham cures the deficiencies in Hartmann noted above.

Furthermore, the Examiner has provided no motivation to combine the teachings of Peckham with those of Hartmann. All that is provided in the rejection after a recitation of what Hartmann and Peckham show is the blanket assertions that "it would have been obvious to one of ordinary skill in the art to modify Hartmann to incorporate [the claim language] in order to turn on the diodes and filter out unwanted signals and to control the operation of the matching circuit."

As argued above, because the Examiner did not provide anything beyond a general assertion of motivation to combine, based on the Examiner's skill in the art, Applicant asserts that the Examiner engaged in hindsight analysis, improperly using Applicant's own claimed invention to provide the motivation to combine the cited references.

Based on at least the arguments given above, Applicant therefore respectfully requests that the Examiner withdraw the rejection of claims 67-69 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hartmann in view of Peckham.

The Examiner has rejected claim 70 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hartmann in view of MacLellan. Applicant respectfully traverses this rejection.

Claim 70 recites an adjustable RFI extraction mechanism including a first transmission line having a predetermined impedance and configured to convey an incoming signal that

includes said UWB signal and said narrowband signal, a second transmission line having a second impedance and configured to convey a portion of said incoming signal for a predetermined distance and reflect said portion of said incoming signal, and a receiving transmission line having a third impedance configured to receive respective portions of said incoming signal from said first transmission line and a reflected portion of said incoming signal from said second transmission line so as to create an impulse response having a first component that has a shape of a wavelet portion of said UWB signal and a second component that is delayed in time and inverted in shape from said wavelet. This combination of first, second, and third transmission lines is not disclosed or suggested by Hartmann or MacLellan, alone or in combination.

The Examiner has asserted that the recited first and second transmission lines are shown in Table 1, and by elements 48 and 50 in Fig. 29 of Hartmann. However, nothing in either element 48 or element 50 discloses or suggests conveying a portion of an incoming signal and reflecting that portion of the signal. Neither the conventional impedance 48 nor the SAW impedance 50 pass only a portion of an incoming signal, and then reflect that signal portion.

Furthermore, claim 70 recites that the incoming signal includes "a UWB signal and a narrowband signal." Nothing in or Hartmann or MacLellan, alone or in combination, discloses or suggests this feature.

As noted above, neither Hartmann nor MacLellan disclose or suggest receiving a UWB signal with a narrowband signal. Hartmann discloses filtering UHF signals, and MacLellan simply discloses RF digital radio. But neither discloses or suggests that their teachings be used in UWB implementations.

Claim 70 also recites a bi-phase wavelet demodulator. Such a demodulator operates to demodulate a bi-phase signal. Pages 17-19 of Applicant's specification disclose one embodiment of how bi-phase demodulation is performed. Nothing in Hartmann or MacLellan, alone or in combination, discloses or suggests the use of a bi-phase demodulator.

Furthermore, the Examiner has provided no motivation to combine the teachings of MacLellan with those of Hartmann. All that is provided in the rejection after a recitation of what Hartmann and MacLellan show is the blanket assertions that "it would have been obvious to one of ordinary skill in the art to modify Hartmann to incorporate [the claim language] so as to produce an output data stream to more efficiently use the available bandwidth of a time-varying channel and/or to provide a flexible and adaptive digital communication system."

As argued above, because the Examiner did not provide anything beyond a general assertion of motivation to combine, based on the Examiner's skill in the art, Applicant asserts that the Examiner engaged in hindsight analysis, improperly using Applicant's own claimed invention to provide the motivation to combine the cited references.

Based on at least the arguments given above, Applicant therefore respectfully requests that the Examiner withdraw the rejection of claim 70 under 35 U.S.C. § 103(a) as being allegedly unpatentable over Hartmann in view of MacLellan.

Claim Amendments

By this amendment Applicant has cancelled claims 45 and 46 without prejudice or disclaimer. Claim 45 is duplicative of claims 42, and claim 46 is duplicative of claim 43. Claims 45 and 46 are not being cancelled to give up any matter that is being claimed, but only to avoid

repeating claim language. The material recited in claims 45 and 46 remains in pending claims 42 and 43.

In addition, Applicant has amended claims 1, 13, 15, 41, 43, 57, 58, 64, and 70 to correct minor clerical errors and problems of antecedent basis.

In particular, Applicant has amended claim 1 to recite change the word "overlap" to "overlaps."

Applicant has amended claim 13 to correct the phrase "isolation device configured couple said splitter to said combiner" to read "isolation device configured to couple said splitter to said combiner."

Applicant has amended claim 15 to correct the phrase "said isolation device is inverting on inverting isolation device" to read "said isolation device is an inverting isolation device."

Applicant has amended claim 41 to correct the phrase "isolation device configured couple said splitter to said combiner" to read "isolation device configured to couple said splitter to said combiner."

Applicant has amended claim 43 to correct the phrase "said isolation device is inverting on inverting isolation device" to read "said isolation device is an inverting isolation device."

Applicant has amended claim 57 to recite "a first transmission line having a predetermined impedance and configured to convey an incoming signal that includes a UWB signal and a narrowband signal," to provide proper antecedent basis, and has amended claim 57 to correct the phrase "from said wavelet," to read "from said wavelet portion." This provides proper antecedent basis.

Applicant has amended claim 58 to recite "means for adjusting a relative position of said first impulse response component and second impulse response component so as to pass a UWB

signal," to provide proper antecedent basis, and has amended claim 58 to correct the phrase "of the radio front end," to read "in the radio front end."

Applicant has amended claim 64 to recite "receiving at said radio-front end a UWB signal corrupted with narrowband interference," to provide proper antecedent basis.

Since all of these changes are made to correct minor errors, they should not serve to further limit the claims in any way.

Applicant has amended claim 70 to recite "a first transmission line having a predetermined impedance and configured to convey an incoming signal that includes a UWB signal and a narrowband signal," to provide proper antecedent basis.

Since these amendments are being made simply to correct clerical errors, they should not serve to further limit the scope of the claimed invention.

Applicant has also amended claims 1, 29, 58, and 71 to better recite the claimed invention.

In particular, Applicant has amended claim 1 to recite a first component that has a first impulsive shape, and at least one other component delayed in time from said first component, and having a second impulsive shape.

Similarly, Applicant has amended claim 29 to recite "a first component that has a first impulsive shape, and at least one other component delayed in time from said first component, and having a second impulsive shape."

Applicant has also amended claim 58 to recite "each of said first impulse response component having a first impulsive shape and the second impulse response component having a second impulsive shape."

Likewise, Applicant has amended claim 71 to recite "means for time-shifting a first impulse response component and a second impulse response component of a UWB radio front end, said first impulse response component having a shape of a first wavelet of a UWB signal and said second impulse response component having a shape of a second wavelet of a UWB signal to be received.

Support for these amendments can be found, for example, in Figs. 4d and 4e, and corresponding disclosure in the specification.

These amendments are not being made in response to any rejections, and are simply being made to more clearly recite the invention.

Allowable Subject Matter

The Examiner has indicated that claims 13, 16-21, and 41-56 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

By this response, Applicant has cancelled claims 19-21 and 45-56 without prejudice or disclaimer. However, Applicant acknowledges that remaining claims 13, 16-18, and 41-44 are allowable.

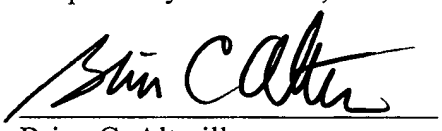
Claim 13 and 16-18 all ultimately depend from claim 11; and claims 41-44 all ultimately depend from claim 40. Since Applicant has shown above that claims 11 and 40 are allowable, Applicant asserts that allowable claims 13, 16-18, and 41-44 are not dependent upon a properly rejected claim, and should be allowed in their current form.

Conclusion

Accordingly, Applicant respectfully submits that the claims, as amended, clearly and patentably distinguish over the cited references of record and as such are deemed allowable. Such allowance is hereby earnestly and respectfully solicited at an early date. If the Examiner has any suggestions, comments, or questions, calls are welcome at the telephone number below.

Although it is not anticipated that any additional fees are due or payable, the Commissioner is hereby authorized to charge any fees that may be required to Deposit Account No. **50-1147**.

Respectfully Submitted,



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